



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

AS

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/329,502 06/10/99 MERRILL

J 31223-62785

025264  
FINA TECHNOLOGY INC  
PO BOX 674412  
HOUSTON TX 77267-4412

IM22/0223

EXAMINER

DANG, T  
ART UNIT

PAPER NUMBER

1764  
DATE MAILED:

02/23/01

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Application/Control Number: 09/329,502

Page 1

Art Unit: 1764



**UNITED STATES PATENT AND TRADEMARK OFFICE**

COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231  
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 13

Application Number: 09/329,502

Filing Date: June 10, 1999

Appellant(s): MERRILL ET AL.

**MAILED**

FEB 23 2001

**GROUP 1700**

William D. Jackson  
For Appellant

**EXAMINER'S ANSWER**

This is in response to appellant's brief on appeal filed 1/29/2001.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows: the double patenting rejection of claims 1-6, 8-

Art Unit: 1764

13, and 15-21 as discussed in the final rejection is still maintained since the terminal disclaimer submitted on 1/29/2001 is improperly signed by an attorney not of record. Once, a proper terminal disclaimer is submitted to overcome the double patenting rejection, claims 21, 15-17 should be allowed.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Invention**

The summary of invention contained in the brief is correct.

**(6) Issues**

The appellant's statement of the issues in the brief is correct.

**(7) Grouping of Claims**

The appellant's statement in the brief that certain claims do not stand or fall together is not agreed with because appellants do not argue claims separately (see the arguments).

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

5,324,877	West et al.	6-1994
EP 0 467 007 A1	Butler	1-1992

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Art Unit: 1764

The Board of Appeal are respectfully reminded that since the amendment after final Office action has been entered, the new ground rejections of claims are applied as below.

*Claims 1-6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al (5,324,877) alternatively in view of the admitted prior art (as disclosed by applicants in the specification).*

West discloses a liquid-phase<sup>step d of claim 1</sup> process of transalkylating polyalkylated aromatic components, such as diethylbenzene<sup>step b of claim 1, claim 4, and claim 5</sup> with benzene<sup>step c of claim 1</sup> in the presence of a typical Y-zeolite having<sup>step a of claim 1, claim 2, and claim 3</sup> a surface area of 350m<sup>2</sup>/gram, a pore size of greater than 7 angstroms, and a silica/alumina of 3 to 6 in a transalkylation zone to produce mono-alkyl benzene, such as ethylbenzene<sup>step d of claim 1</sup> (the abstract; col. 5, line 54 through col. 6, line 5; col. 12, lines 21-26).

West also discloses in figure 1 that the transalkylation product is recovered as called for in step e of claim 1.

Regarding claim 6, figure 1 of the patent to West shows that transalkylation product stream 62 is separated in separation columns 36, 42, and 48, and that polyethylbenzene being unreacted in the transalkylation process, if present, is recycled to transalkylation zone 60.

West discloses that the transalkylation process is operated by reacting unreacted benzene and polyalkylated benzenes recovered from an up-stream alkylation effluent produced by alkylating benzene with ethylene<sup>step f of claim 1, claim 8, and claim 9</sup> in an alkylation zone containing a molecular sieve, such as Y-zeolite, and silicalite<sup>steps f and g of claim 1</sup> (the abstract; figure 1, col. 3, lines 34-56; col. 10, lines 27 through col. 13, line 10).

Art Unit: 1764

West does not disclose that the average pore size of silicalite is **less than** the average pore size of Y-zeolite<sup>step f of claim 1</sup>. However, applicants disclose **so** on page 3, lines 9-14 in the specification of this application.

West does not **specifically** disclose using a molecular sieve having a smaller pore size than Y-zeolite for the alkylation process. However, **applicants admit that** "the molecular sieves employed in the separate alkylation and transalkylation reactors can be the same or different . . . it is often the practice to employ a relatively small to intermediate pore size molecular sieve . . . in the alkylation reactor and follow this with a molecular sieve having somewhat larger pore size . . ." (see page 3, lines 9-14 in the specification of this application). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the West process by operating the alkylation process in the presence of a molecular sieve having smaller pore size, such as silicalite and operating the transalkylation process in the presence of a larger pore size, such as Y-zeolite to arrive at the applicants' claimed process as called for in claim 1, namely step (f) since this selection of catalysts for alkylation and transalkylation processes in an alkylation-and-transalkylation-process is often practiced in the industry as admitted by applicants (see page 3, lines 9-14 in the specification of this application).

The limitation of step h of claim 7 can be found in figure 1 of the patent to West.

*Claims 10-13, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al (5,324,877) in view of the admitted prior art (as disclosed by applicants in the specification) further in view of Butler (EP 467,007).*

West discloses a process as discussed by the examiner in the above 103 rejection.

West does not disclose further that the alkylation process is operated in the gas-phase in a *multistage* alkylation reaction zone having a plurality of series catalyst beds (see the whole patent to West). However, Butler et al disclose a substantially the same process as the West process in which the alkylation of benzene with ethylene in the presence of silicalite or ZSM-5 molecular sieve is carried out in the *gas* phase in a *multistage* alkylation reaction zone having a plurality of series catalyst beds<sup>steps a and c of claims 10 and 18</sup> (the abstract; page 7, lines 45-59).

It would have been obvious to one having ordinary skill in the art at the time invention was made to have modified the West process by operating the alkylation process in the *gas* phase and by using a *multistage* alkylation reaction zone having a plurality of series catalyst beds if a silicalite or ZSM-5 zeolite is used for the alkylation process since Butler discloses that "the alkylation step can be conducted as a vapor-phase reaction employing a catalyst such as silicalite or ZSM-5. It is known that silicalite or ZSM-5 is a pentasil zeolite<sup>step a of claim 18</sup>.

West discloses recycling unreacted benzene to alkylation reaction zone 24<sup>step f of claims 10 and 18</sup> through lines 38, 16, 14, and 22.

Other limitations recited in steps of claims 10, 18, dependent claims 11-13, and 19-20 which are not mentioned in this rejection have already been discussed fully in the 103 rejection above.

### **(11) Response to Argument**

The argument that the West Y-zeolite catalyst containing 5 % water having a surface area of 563 m<sup>2</sup>/g is produced by hydrating a raw Y-zeolite having a surface area of 450 m<sup>2</sup>/g is not persuasive since as discussed in the above rejection, the West Y-zeolite has the surface area of at least 350 m<sup>2</sup>/g (see the paragraph bridging columns 5 and 6 of the West reference and page 9 of

Art Unit: 1764

the appeal brief) **not** 450 m<sup>2</sup>/g as assumed by appellants. Further, West discloses that the Y-zeolite catalyst contains above 3.5 weight percent of water, **not** 5 weight percent of water as assumed by appellants. Therefore, the examiner maintains that once a starting Y-zeolite having a different surface area, such as 350 m<sup>2</sup>/g, is used to produce the final Y-zeolite containing a different amount of water, such as 3.5 wt%, this final Y-zeolite catalyst would be expected to have the appellants' claimed surface area.

The argument that West does not disclose using the Y-zeolite in the transalkylation reactor and employing another catalyst having pore size less than the same of the Y zeolite for the alkylation reactor is not persuasive since as admitted by applicants in page 3, lines 9-14 of the specification of this application, "it is often the practice to employ a relatively small to intermediate pore size such as ZSM-5, ZSM-11, or silicalite in the alkylation reaction and follow this with a molecular sieve having somewhat larger pore size, such as zeolite-Y. . .".

The argument that the examiner improperly uses the appellants' own disclosure in the rejection is not persuasive since as discussed, the method of using "a relatively small to intermediate pore size such as ZSM-5, ZSM-11, or silicalite in the alkylation reaction and follow this with a molecular sieve having somewhat larger pore size, such as zeolite-Y" is not invented by appellants, but is often practiced in the chemical industry.

For the above reasons, it is believed that the rejections should be sustained.

Application/Control Number: 09/329,502  
Art Unit: 1764

Page 7

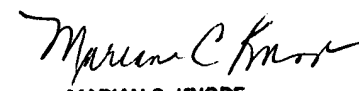
Respectfully submitted,

Thuan D. Dang  
Examiner  
Art Unit 1764




9a329502  
February 23, 2001

FINA TECHNOLOGY INC  
PO BOX 674412  
HOUSTON, TX 77267-4412



MARIAN C. KNODE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700



GREGORY MILLS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700  
*Appeal Confirmed*